

NASA TECH BRIEF



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Rocket Engine Analog Simulation

Mathematical equations have been developed for use in simulating the operation of a rocket engine, simulating destructive and nondestructive tests to verify engine design feasibility, and investigating nonlinear variations in engine performance. The mathematical models represent all major engine components, including start tank, gas generator, pumps, turbines, valves, main combustion chamber, and injectors. The equations, which define the operation of the engine system, are scaled for analog computer simulation. The analog simulation data include data for diode function generators and potentiometer settings required to generate equation constants. The simulation system uses three electronic consoles and nine recorders capable of recording 72 engine parameters simultaneously. Total recording capability with the three consoles is 96 channels, which can simultaneously record any combination of engine parameters during a single run.

Although the simulation was designed specifically for a rocket engine, a portion of the information,

specifically that dealing with pump design feasibility and cavitation characteristics, should be of interest to pump design engineers in nonaerospace industries.

Note:

Documentation for the innovation is available from:
Clearinghouse for Federal Scientific
and Technical Information
Springfield, Virginia 22151
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Patent status:

No patent action is contemplated by NASA.

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